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and published by no less an association than the Federation of Horticultural Societies of Belgium. It is entitled "Une Excursion Botanique au Colorado et dans le Far West" and is translated by Dr. Henri Fonsny, of Verviers. Prof. Jones is collecting largely in the west and enough of his specimens have reached Europe to make him known there, and the desire to know more of the country that produces such plants has led to the writing of this paper.

THE IOWA ACADEMY OF SCIENCES has published a pamphlet of some 30 pages containing its proceedings from August 1875, the date of organization, to July 1880. The number of Fellows cannot exceed 30, and only such persons as have done good scientific work are eligible, the assent of three-fourths of the members being necessary to a choice. From the list of Fellows given the note but two to whom some branch of botany is credited as a specialty, namely, Prof. C. E. Bessey and Dr. C. M. Hobby. The latter gentleman publishes a list of the "Fresh Water Algæ found in Iowa." Twenty-seven genera are represented by seventy two species, *Spirogyra* containing eighteen.

THE STEM OF PUMPKIN FOR ILLUSTRATING PLANT HISTOLOGY.—The stem of the common pumpkin (*Cucurbita Pepo*) is admirably adapted for use in the laboratory to illustrate many kinds of cell-structures, and the larger part of the tissues of the higher plants. It is of a convenient size to be held for sectioning, and after remaining in a sufficient quantity of strong alcohol for awhile becomes very solid, so that exceedingly thin sections are easily obtained. The cells are comparatively large and a power of 250 to 500 diameters will demonstrate almost every detail.

A cross-section of the stem shows without magnification five small fibro-vascular bundles lying beneath the five angles of the stem, with the same number of much larger bundles situated between them, but deeper. These are imbedded in the fundamental tissue, and the whole surrounded by a cortical rind. The center of the stem is hollow, due to rupture of the fundamental tissue from expansion by growth. Other features of the stem can be made out without a microscope, but it is best to revert to them after their full significance is understood.

An enumeration of the kinds of cells and tissues to be met with will answer the purpose of this notice, as no extended description is intended. The cortical rind is composed of epidermis and hypodermis. Three forms of cells belong to the epidermal system—simple epidermis cells, hairs, and guard-cells of the stomata, the latter best studied in cross sections of the stem. The fundamental system comprises the large-celled, thin walled parenchyma in which the fibro-vascular bundles lie, and the hypodermal tissues. The parenchyma is colorless and varies little except in size of the cells. The hypodermis consists of two layers, encircling the stem, partly performing the office of imparting strength, and partly containing assimilative protoplasm. The innermost of these is of uniform thickness and made up of slender wood cells. Thin transverse septa are occasionally met with, which

are usually regarded as subsequent formations,\* but may, however, be the persistent partitions of cells that generally coalesce completely to form single wood-cells.† The wall of the cells is differentiated into three lamellæ—a middle one, with one on either side—and has simple pits not penetrating the middle lamella. These pits are twisted in such a way that they have the appearance of being situated at the intersection of the arms of an oblique cross, when seen in front view. To determine their structure requires careful examination with a high power. Between the wood-ring and the epidermis lies a ring of tissues of very considerable importance, but not homogeneous like the last. It consists of parenchyma containing chlorophyll, in which lie numerous masses of collenchyma in contact with the epidermis but not extending quite deep enough to come in contact with the cortical wood. The stomata are all situated in the part of the epidermis touched by the chlorophyll bearing parenchyma, which is readily distinguished upon the exterior of the stem as interrupted lines of darker green.

The fibro-vascular bundles are open, two-sided bundles, but peculiar in having an additional phloem portion on the axial side. The xylem and the outer phloem are separated by the cambium, in which the progressive transformation from simple uniform cells to the various mature cells of each portion can be traced. Both the axial and outer phloem consist of sieve-tubes, interspersed with long, slender parenchyma cells, the two together forming "soft bast." These are excellent examples of sieve tubes: the perforated end-partitions, the broad thin spots and sieve plates of the side walls, and the conspicuous protoplasmic contents are readily made out in detail. The xylem contains all gradations between the extreme form of annular vessels with widely isolated rings, on the one hand, through spiral, reticulated, scalariform, to pitted vessels, on the other hand. The structure of the walls of these vessels can only be studied satisfactorily under high powers. Between and about the vessels is wood-parenchyma.

To sum up the tissues of the stem of *Cucurbita* :

Epidermal system :

Epidermis.

Stomata.

Hairs.

Fundamental system :

Interfascicular parenchyma.

Hypoderma.

Cortical wood.

Cortical parenchyma.

Collenchyma.

Fibro-vascular system :

(Cambium).

Phloem.

Sieve-tubes.

Phloem parenchyma.

Xylem.

Vessels.

Annular.

Spiral.

Reticulated.

Scalariform.

Pitted.

Wood parenchyma.

To these should doubtless be added laticiferous tissue sometimes

\*Sachs, Text-book, p. 101.

†Bessey, Botany, p. 74.

detected in the phloem. It will be observed we have illustrations here of the three tissue systems; of all the principal sorts of tissues, except sclerenchyma, i. e., parenchymatous, fibrous, laticiferous, sieve, and tracheary tissues; with several well marked varieties of the first and second. The only prominent varieties not included are cork, bast, and tracheides, modifications respectively of parenchymatous, fibrous, and tracheary tissues. It would probably be difficult to select any one common example that more admirably illustrates tissues and tissue-elements, and, withal, so simply constructed for histological study.—J. C. ARTHUR, *University of Wisconsin*.

HABENARIA GARBERI, n. sp.—Stem erect, a foot or more high, bearing at the base 1 to 2 globular tubers  $\frac{1}{2}$  to 1 inch in diameter, leafy; leaves oblong-lanceolate; spikes 3 to 6 inches long, loosely or densely flowered; bracts lanceolate, acuminate, about as long as the ovary; flowers greenish-yellow; exterior perigonial divisions broadly ovate, the lateral ones concave and reflexed; the two interior ones erect and 2-parted, the anterior division involute-filiform and truncate, the longer posterior one cuneate; lips larger than the perigone, entire, linear from a broad base, obtuse; spur filiform, equalling or exceeding the ovary in length, 6-9 lines.

Collected in 1878, in wet or damp hummocks, around Manatee, S. Florida, by that indefatigable and zealous botanist, Dr. A. P. Garber, for whom it is named. It blooms in the fall or winter. The flowers exhale a pleasant, verbenalike odor. It is No. 315 of Dr. G.'s Florida collections.—THOS. C. PORTER.

NOTES FROM PROVIDENCE, R. I.—In a recent visit to Narragansett Pier, R. I., I found the species *Solidago lanceolata*, L. and *S. tenuifolia*, Pursh thronged with the lovely moth *Deiopeia bella*. One could easily have collected enough to supply exchanges for years. It was not to be seen about *S. sempervirens* which grew not far off.

I have noticed a restricted limitation of *Aster Novæ Angliæ*, L. It is not found in the immediate vicinity of our city, but about six miles north becomes very abundant on the road-sides and continues so in a belt to the west. One as suddenly passes out of its range. I think it grows best in the limestone region about here, where it is truly magnificent.

Mr. J. L. Bennett reports *Ambrosia trifida* L. as having appeared in our city. It is curious that it has not done so before, as at Hartford, ninety miles away, it is very common and might have been expected to follow the railway. But then while *Cichorium Intybus* is a nuisance about Boston, it is very infrequent here; its nearest approach, in quantity, is, perhaps, at Canton.

Brown University has received from the Trustees of the late Col. Olney \$10,000, the income to be used for the increase of his herbarium and botanical library. A further sum of \$25,000 is left to the college for a professorship of Natural History, "one of the duties of the professor being to lecture on Botany." This sum is not yet acquired.